11. SIPHONAPTERA ET ANOPLURA.

1. Siphonaptera

by the

Hon. **N. CHARLES ROTHSCHILD.**

With 1 plate.

The specimens treated of in the present article were collected by Professor YNGVE SJÖSTEDT in the Kilimandjaro-Meru District and it is at his request that I have undertaken to examine the collection and describe the new species it contains. I agreed the more readily to his request, as practically no Siphonaptera are recorded from tropical East Africa.

Of the 6 species of Siphonaptera (about 250 specimens) that Professor SJÖSTEDT secured no less than 3 are new. One of these must be placed in a new genus and is a form of great interest.

Echidnophaga larina ROTHSCH.

Echidnophaga larina ROTHSCHILD, THOMPS. Yates & JOHNST. Laborat. Report VII. 1. p. 49. n. 3. t. 1. fig. 12, t. 2. fig. 18, t. 3. fig. 25 (1906) (Cape Colony, Somaliland, Abyssinia).

A long series of both sexes from the Massaisteppe between Kilimandjaro and Meru, off *Phacochoerus africanus*, August 4. and October 9.

Dermatophilus penetrans L.

Pulex penetrans LINNÉ, Syst. Nat. (ed. x) p. 614. n. 2 (1758).

A number of ♀♀ from Kibonoto, November 6.

This American insect has become a real pest in tropical Africa, being very abundant in all suitable places from the west to the east coast. It has apparently not yet reached Abyssinia and Somaliland.

Ctenocephalus canis CURTIS.

Pulex canis CURTIS, Brit. Entom. III. no. 114. fig. A—E. fig. 8 (1826).

Very common on various hosts. Kibonoto, July 4., off *Herpestes galera robusta*; Kibonoto, August 9., off *Tragelaphus sylvaticus meruensis;* Massai-steppe, November 5.. off *Bubalis cokei;* Kibonoto, off *Genetta suahelica*; Kibonoto, July 3., off *Colobus caudatus.*

Mocopsylla gen. nov.

Head. — A small pointed frontal tubercle directed backwards, is situated close to the antennal groove (Pl. 1 f. 1). The oral edge is very short, the mouth-parts being directed downwards. The lower angle of the oral edge is enlarged into a blunt tooth-like lobe. The upperlip and mandibles are broad, the former bearing a number of widely seperated tubercles along the upper edge from the base to the tip. The mandibles are encased in the rostrum formed by the labium and the two labial palpi. The latter reach to the apex of the forecoxa. The labial palpi are not completely divided into segments, the segmentation being indicated only at the anterior edge (Pl. 1 f. 2). The eye is large. The antennal groove is closed. The first segment of the antenna of the ♂ is large, the second segment being transverse, almost rectangular, bearing a transverse row of bristles, which are specially long in the ♀, besides smaller bristles. The club of the antenna is of the *Pulex*-type, being short, and its anterior side non-segmented. Thorax. — The thoracical segments are short, with one row of bristles on each tergite and no comb. The rostrum projects downwards in between the forecoxae. The sternite of the mesothorax is narrow, the pleural portion being vertical and not divided by a suture. There is however an internal incrassation extending from the insertion of the coxa obliquely forward ending at the anterior edge of the sternite on a level with the ventral outline of the prosternum. The stigma of the mesosternite is placed some way from the coxa. The episternum of the metathorax is large. The epimerum is of the *Pulex*-type, being much more extended in a vertical than in a longitudinal direction. Abdomen. — In shape similiar to that of *Pulex*, the segments bearing very few bristles. There is one moderately long subapical bristle on the seventh tergite, placed away from the edge of the segment. Legs. — The hindcoxa is somewhat pear-shaped, the posterior edge not being deeply excised, but slanting considerably from beyond the centre to the apex, on its inner surface there is a patch of short spines. The first tarsal segment of the fore-and midtibia is shorter than the second. The fifth is long. The claw is also long and slender, with a small basal tooth. Modified segments. — ♂. The eighth sternite is large. The ninth tergite has two manubria on each side, the lateral portion of the segment not being separated by a suture from the dorsal portion which bears the sensory plate. There are two free lateral processes on the tergite. The ninth sternite lacks an internal vertical arm. — ♀. The stylet is present. The eighth tergite is large and completely divided in the dorsal line.

The vestigial segmentation of the labial palpus and the strong serration of the mandibles are very interesting features in the organisation of this new species, which approaches the Sarcopsyllids.

Moeopsylla sjoestedti spec. nov.

Pl. 1 fig. 1—5. — Head. — The frons especially in the ♂ (fig. 1) is strongly rounded. There is a bristle in front of the eye and another near the oral edge. The occiput bears on each side a bristle behind the base of the antennal groove, two or three in the centre and a row of three or four before the hinder edge, there being in the ♂ also a row of minute hairs along the antennal groove. The maxillary palpus reaches to the apex of the forecoxa, the second segment being longer than the first. Thorax. — The three thoracical tergites bear a row of 4 bristles on each side. On the mesosternite there are two bristles dorsally of the stigma. The episternum of the metathorax bears one bristle, while there are two rows on the epimerum (3 or 4, and 5). Abdomen. — The abdomen is closely applied to the thorax. The tergites 1 to 6 bear two moderately long bristles at each side on the back and a small hair behind the stigma, on the third tergite (♀) or on the second and third (♂) there being usually a third dorsal bristle present. The corresponding hairs of the seventh tergite are small. The subapical bristle of this tergite, placed on a cone, is of about the same length as the bristles of the metathoracical epimerum. This bristle is accompanied by a small hair standing dorsally of it. The sternites of segments 2 to 6 bear one bristle on each side. Legs. — The midcoxa is small, being almost oblong and practically lacking the internal forked rod-like incrassation found in other *Pulicidae*. The hindcoxa is widest near the base, being longer than it is broad, and bears one long and two short bristles posteriorly at the apex. On the inner side there are two irregular rows of numerous short spines. The hindfemur is slender; its underside is flattened, the edges being almost carinate, the femur appearing in side-view almost angulate near the base where the flattened portion begins. The hind femur bears one (♀) or two (♂) bristles on the outerside ventrally before the apex, while there is a complete subventral row of bristles on the inner surface. The bristles at the hind edge of the tibiae are few in number, being moreover short and thin on the midtibia. There are only three distinct notches at the edge of the midtibia inclusive of the apical notch, the longer bristle situated in the central notch being only a little longer than the tibia is broad. The bristles of the midtarsus are thin, with the exception of those on the fifth segment, which are comparatively stout. The hindtarsus is much broader than the midtarsus. The first segment of the hindtarsus bears one pair of short stout bristles besides the apical bristles, all the other bristles being thin, segments 2 to 4 are triangular in outline, the fourth segment bearing a long thin apical hair reaching to the apex of the fifth segment. This last segment is slender and bears on each side, in all the tarsi, four bristles of which the fourth is the shortest and thinnest, there being moreover a long thin hair on each side at the apex. The proportional lengths of the mid-and hindtarsal segments are as follows:

Midtarsus	♂	18	22	13	7	26
»	♀	22	27	15	9	30
Hindtarsus	♂	32	23	16	10	30
	♀	44	26	18	12	32

Modified segments. — ♂. The eighth sternite is large, triangular, the apex being rounded off. It bears a number of small hairs, which are more numerous near the ventral edge. The dorsal manubrium (M^1) of the ninth tergite (Pl. 1. fig. 3) has the tip curved down-wards, while the lower manubrium (M^2) is practically straight. The upper process (F^1) of the clasper is long, slender in side-view, and hairy, while the lower process (F^2) is very short. In dorsal aspect the process F^1 is lanceolate (Pl. 1. fig. 4). The ninth sternite (ix. *st*) is elongate-triangular with the tip curved upwards to form a hook. — ♀. The eighth tergite (Pl. 1. fig. 5) does not bear any bristles on the dorsal half, while there is a row of short stout bristles along the apical edge and one or two bristles on the side on the lower half of the sclerite. The rim of the sensory organ projects dorsally over the organ itself. The apex of the anal tergite bears some stout spines; the anal sternite is small (Pl. 1. fig. 5). The stylet is conical, being about three times as long as it is broad at the base.

Length (of specimens in alcohol): ♂ 1½ mm., ♀ 2½ mm.

A series of both sexes from the Massai-steppe, off *Phacochoerus africanus*, and also from the Kibonoto-steppe of the same host, October 9.

Ceratophyllus infestus spec. nov.

Pl. 1. fig. 6. 7. — A near ally of *C. fasciatus* Bosc. (1801), but larger, differing especially in the hairs of the abdomen and in the structure of the modified segments.

Abdomen. — The short spines placed at the apical edges of the proximal segments are situated in a deep sinus. The sternites are much more hairy than in *C. fasciatus*. The first sternite bears in the ♂ about 5 hairs on the side, while there are 15 or more in the ♀. The next four sternites have a row of 3 or 4 (♂) or 4 to 5 (♀) bristles and in front of this row a number of shorter ones, which are more numerous in the ♀ than in the ♂, there being in the ♀ as many as 16 bristles altogether on each side of the sternite of the third segment. Legs. — The tarsi are stouter than in *C. fasciatus*, the fifth segment especially being broader. Modified segments. — ♂. The eighth tergite (Pl. 1. fig. 6, VIII *t*) is large and bears at the edge numerous long and short bristles, there being also some on the side. The lower distal angle of this sclerite is produced into a short finger-like process. The manubrium (*M*) of the clasper is much broader than in *C. fasciatus*. The dorsal portion of the ninth tergite (ix. *t*) projects frontad. The ventral edge of the clasper (*Cl*) is strongly convex. The finger (*F*) somewhat resembles that of *C. fasciatus*, bearing at the distal edge three bristles and a short hair. The ninth sternite (ix. *st*) is also of the same type as in *C. fasciatus*, the horizontal arm being divided by a ventral sinus into a proximal and a distal portion. — ♀. The seventh sternite (Pl. 1. fig. 7, viii. *st*) is sinuate, the sinus being very narrow. The bristles on the eighth tergite are more numerous than in *C. fasciatus*.

A small series off a squirrel (*Funisciurus ganana*) found at Kibonoto on July 23 and August 8.

Ctenopsyllus aethiopicus spec. nov.

Pl. 1. fig. 8. 9. — This species is closely allied to *C. musculi* Dugès (1832), but differs in the following particulars.

Head. — The head bears three genal spines, the central one being the longest. The genal process is visible above the uppermost spine, having the appearance of a narrow fourth spine. The bristles of the head are arranged as in *C. musculi*. The third and fourth bristles of the frontal row, counted from the antennal groove, are modified into short, obtuse, spines, the second bristle also being shorter and less pointed than the others, sometimes resembling those two spines. Abdomen. — The abdominal tergites bear two rows of bristles. The first row, however, is represented on segments 4 to 6 by 2 or 3 bristles only, which are placed above the stigma. On the seventh segment the first row is represented by one lateral bristle, the segment bearing, besides, a dorsal bristle. There are 3 apical bristles on the seventh tergite in the ♂, the lower bristle situated apart from the upper pair (Pl. 1 fig. 8), while there are four bristles in the ♀ placed in two separate pairs. Legs. — The fourth hind-tarsal segment is somewhat longer than in *C. musculi*. Modified segments. — ♂. The eighth sternite (Pl. 1 fig. 8, viii. *st*) is triangular in side-view, the pointed apex being somewhat produced and bearing a number of long bristles. In a ventral view the sternite is deeply sinuate. The obtuse process *P* of the clasper also bears some long bristles. The movable »finger» (*F*) is curved, widening towards its apex and bearing three rather stout bristles at the distal (ventral) edge in the upper half, there being several smaller bristles in the lower half. The ninth sternite (ix. *st*) is very different from that of *C. musculi*. The upper portion of the internal (vertical) arm of the ninth sternite is very strongly dilated. The distal portion of the external (horizontal) arm ends in a hook. — ♀. The eighth tergite (Pl. 1 fig. 9) bears a few short hairs above the stigma and a long and a short one below the stigma; the apical edge is rather deeply emarginate and the bristles at and near this edge are much more numerous than in *C. musculi*.

A series of both sexes from Kibonoto, 3. July 1905, off *Mus hildebrandti*.

List of Siphonaptera hitherto recorded from the Kilimandjaro-Meru district.

1. *Echinophaga larina* Rothsch.
2. *Dermatophilus penetrans* L.
3. *Ctenocephalus canis* Curtis.
4. *Mocopsylla sjoestedti* Rothsch. n. g. & sp.
5. *Ceratophyllus infestus* Rothsch. n. sp.
6. *Ctenopsyllus æthiopicus* Rothsch. n. sp.

Tafel 1.

Fig. 1. Head of *Mocopsylla sjoestedti* Rothsch. n. sp.
2. Rostrum of the same.
» 3. Genitalia of the male of the same.
4. Dorsal aspect of the flap F' of the same.
5. Last abdominal segments of the female of the same.
6. Genitalia of the male of *Ceratophyllus infestus* Rothsch. n. sp.
7. Seventh abdominal sternite of the female of the same.
8. Genitalia of the ♂ of *Ctenopsyllus aethiopicus* Rothsch. n. sp.
9. Seventh and eighth abdominal segments of the female of the same.

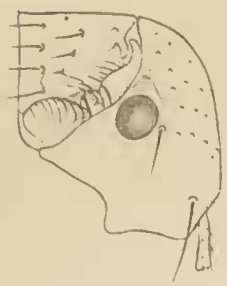

Fig. 1

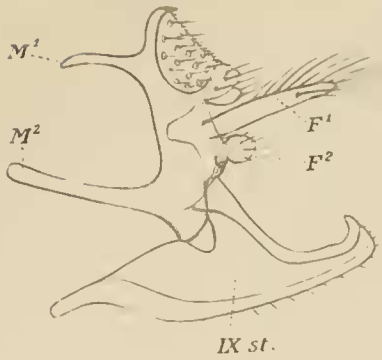

Fig. 3

Fig. 7.

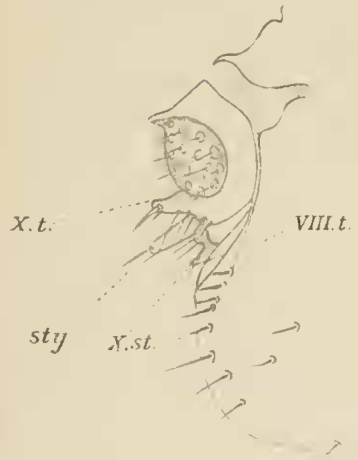

Fig. 5.

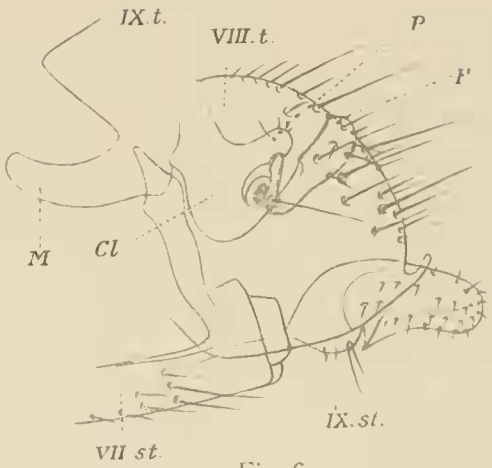

Fig. 6.

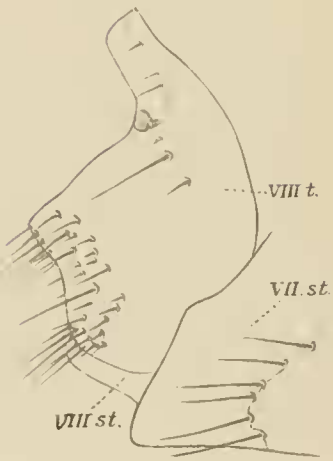

Fig. 9.

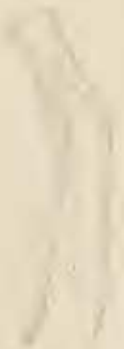

Fig. 2.

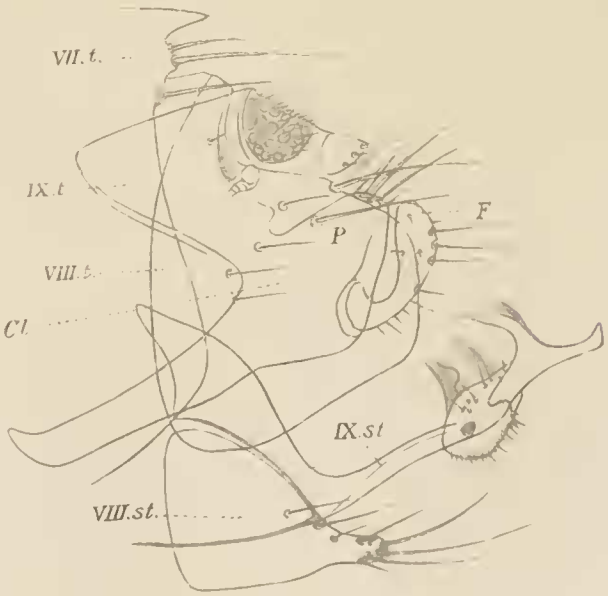

Fig. 8.

Fig. 4.